

REMARKS

Claims 1-57 are pending in the application.

Claims 1-57 stand rejected.

Claims 1, 16, 28, 30 and 45 have been amended.

Formal Matters

Applicants thank the Examiner for the Examiner's careful examination of the instant application. The Abstract of the Disclosure was objected to for exceeding the limit of 150 words. The Abstract of the Disclosure has been amended to address the Examiner's concerns. No new matter is added thereby.

Claim 28 has been amended to address an informality.

Rejection of Claims under 35 U.S.C. §101

Claims 1-2 and 30-31 stand rejected under 35 U.S.C. §101 for being directed to non-statutory matter. Applicants respectfully traverse this rejection.

Applicants respectfully submit that the claimed invention is not simply the manipulation of an abstract idea and does not read on a mental process, but is indeed statutory subject matter. Not only does the claimed invention provide useful, concrete and tangible results, as well as advancing the technological arts, but (as can be seen in claims 1-2 and 30-31) is drawn to a method that schedules a resource among a plurality of elements, which Applicants respectfully submit is statutory subject matter. This

method of the claimed invention is statutory subject matter because of the physical nature of the resource and elements recited in the claims.

As to the question of this method being simply an abstract idea, Applicants note that any step-by-step process, whether it is electronic, chemical, or mechanical, involves an “algorithm” in the broadest sense of the term. *See State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1374-75, 47 USPQ2d 1596, 1502 (Fed. Cir. 1998), cert. denied, ---U.S.--- 119 S. Ct. 851 (1999). The Supreme Court noted that “unpatentable mathematical algorithms are identifiable by showing that they are merely abstract ideas constituting disembodied concepts or truths that are not ‘useful.’ ...To be patentable an algorithm must be applied in a ‘useful’ way.” *Id.* At 1373, 47 USPQ2d at 1601. Applicants therefore respectfully assert that scheduling a resource among a plurality of elements is applying the use of mathematics in a useful way, although admittedly, the method recited in the rejected claims does not explicitly include the use of mathematical relationships.

While Applicants believe that claims 1 and 30 in their original form were sufficient for purposes of this distinction, in order to more clearly point out the fact that the claimed invention is not simply an abstract idea and does not read on a mental process, claims 1 and 30 have been amended to include the element of “scheduling a resource among a plurality of elements,” which was previously recited in the preamble of the claims. As noted previously, the physical nature of the resource and elements recited in claims 1 and 30 situate these claims, as well as the claims depending therefrom, squarely in the realm of statutory subject matter.

Applicants therefore respectfully submit that the invention as claimed in claims 1-2 and 30-31 is statutory subject matter under 35 U.S.C. §101.

Rejection of Claims under 35 U.S.C. §112

Claims 16-29 and 45-54 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicants have amended claims 16 and 45 to address the Examiner's concerns.

Rejection of Claims under 35 U.S.C. §103: Jones

Claims 1-15, 30-44, and 55-57 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jones et al., U.S. Patent No. 5,812,844 (Jones). Applicants respectfully traverse this rejection.

Applicants note that Jones fails to teach all the elements of the claimed invention. As mentioned in the Office Action, Jones does not teach “assigning one of the plurality of elements to use the resource for a second period-of-use responsive to the measure-of-use and an element-specific selection adjustment for each element in the plurality of elements.” Instead, Jones teaches a scheduler that assigns a thread to a processor responsive to the earliest restart time of the ready threads. This restart time is a function of an execution time and a CPU reservation. Thus, Jones teaches a scheduler that assigns a thread to a processor responsive to an execution time and a CPU reservation. (column 12, lines 1-28). Jones does not disclose an assignment of an element to a resource responsive to the element specific selection adjustment for each element in a plurality of

elements. In fact, Jones does not even show, teach or suggest an element specific selection adjustment.

The Office Action also states that “it would have been obvious to one of ordinary skill in the art to have applied the teaching of Jones for the assigning step in order to provide a means for efficiently allocating the processor for a thread for the appropriate amount of time without having to interrupt the thread to reevaluate the schedule.” In response to this statement, Applicants address (1) whether it would have been obvious to one of ordinary skill in the art to apply the teachings of Jones to provide the assigning step of claim 1, and (2) whether the assigning step provides a means for efficiently allocating the processor for a thread for the appropriate amount of time without having to interrupt the thread to reevaluate the schedule.

(1) Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art to apply the teachings of Jones for the assigning step because Jones does not recognize the advantages provided by the claimed assigning step; therefore, no motivation exists to apply the teachings of Jones for the assigning step. Jones uses an execution time and a CPU reservation to select a thread for execution and keeps threads from running too long by limiting execution time. (column 12, lines 1-28). Jones does not recognize the advantages of choosing which element to assign to a resource “responsive to said measure-of-use and an element specific selection adjustment for each element in said plurality of elements,” as claimed in claim 1. The advantages of using an element-specific selection adjustment in assigning an element to a resource include, among other benefits:

- (i) enforcing long-term fairness to each element, and

(ii) allowing latency-sensitive elements to be preferably selected.

Jones fails to recognize the foregoing advantages of the claimed invention because Jones fails to recognize the problem solved by the present invention; therefore, it would not have been obvious to one of ordinary skill in the art to apply the teachings of Jones for the assigning step.

(2) Applicants also note that the Office Action appears to misconstrue the assigning step of claim 1 by suggesting that the assigning step provides a means for efficiently allocating the processor for a thread for the appropriate amount of time without having to interrupt the thread to reevaluate the schedule. While the claimed invention might provide such a result, the assigning step is driven by assigning one of a plurality of elements to a resource in a manner that is responsive to a “measure of use” and an “element specific selection adjustment” for each element in said plurality of elements.

Applicants do not concede that it would have been obvious to one of ordinary skill in the art to have applied the teaching of Jones for the assigning step to provide a means for efficiently allocating the processor to a thread for the appropriate amount of time without having to interrupt the thread to reevaluate the schedule. However, in light of the foregoing discussion, Applicants submit that it would not be obvious to one of skill in the art to apply the teaching of Jones for the assigning step. Such would be the case even if it would have been obvious to one of ordinary skill in the art to have applied the teaching of Jones to “efficiently allocate the processor to a thread for the appropriate amount of time without having to interrupt the thread to reevaluate the schedule,” because such application finds no motivation in Jones. Applying the teachings of Jones

for the assigning step finds no motivation in Jones because Jones does not recognize the problem solved by the claimed invention or the advantages of the claimed invention.

Applicants respectfully submit that claim 1 clearly distinguishes over Jones, taken alone or in view of the skill in the art. Applicants submit that these arguments apply with equal force to claims 30 and 55. Applicants therefore respectfully submit that independent claims 1, 30 and 55, as well as claims 2-15, 31-44, and 56-57, which depend on claims 1, 30 and 55, are allowable for at least the foregoing reasons. Accordingly, Applicants respectfully submits that claims 1-15, 30-44, and 55-57 are in condition for allowance.

Rejection of Claims under 35 U.S.C. §103: Jones in view of Chow

Claims 16-29 and 45-54 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jones et al., U.S. Patent No. 5,812,844 (Jones) in view of Chow et al., U.S. Patent No. 6,438,134 (Chow). Applicants respectfully traverse this rejection.

With respect to the references cited, Applicants respectfully submit that Jones, in view of Chow, fails to show, teach or suggest the limitations of claim 16. As mentioned in the Office Action, Jones does not teach that “the plurality of elements is a plurality of queues and said resource is bandwidth of an output port of a data switch.” Furthermore, as previously discussed, Jones does not teach “assigning one of said plurality of elements to use said resource for a second period of use responsive to said measure-of-use and an element-specific selection adjustment for each element in said plurality of elements.”

Chow does not remedy either of these deficiencies of Jones to provide the limitations of claim 16. First, in column 3, lines 16-47 Chow discloses a resource that is

idle bandwidth allocated to a queue. However, Chow does not teach that the resource is the bandwidth of an *output port of a data switch*, as claimed in claim 16. Second, in column 3, lines 16-47 Chow does not show, teach or suggest assigning one of said plurality of elements to use said resource for a second period of use responsive to even a measure of use. In conclusion, both Jones and Chow fail to show, teach or suggest the following two limitations of claim 16: (1) the plurality of elements is a plurality of queues and said resource is bandwidth of an output port of a data switch and (2) assigning one of said plurality of elements to use said resource for a second period of use responsive to said measure-of-use and an element-specific selection adjustment for each element in said plurality of elements.

Furthermore, neither Jones nor Chow provides any motivation to combine their disclosures to provide any advantages over either reference taken separately. This is likely due, at least in part, to how Jones and Chow address different problems in different systems. Chow solves the problem of sub-optimal idle bandwidth distribution by decoupling the instantaneous idle bandwidth of a queue from the allocated service rate of the queue. (column 3, lines 17-34). Jones solves problems related to device interrupt handling by using time specific scheduling constraints to limit the amount of time a thread can execute. (column 2, lines 25-40).

Jones provides no motivation to look to Chow to provide better time specific scheduling constraints because Chow focuses on a handling idle bandwidth, and the principles taught by Chow would not provide any advantages to a system for providing time specific scheduling constraints. Chow provides no motivation to look to Jones to provide improved handling of idle bandwidth because putting time specific scheduling

constraints on bandwidth allocation would not provide any further advantages to Chow's system. In conclusion, neither Jones nor Chow provides any motivation to combine their references to provide additional advantages over either reference taken separately; therefore, neither reference provides any motivation to combine their references to provide the advantages of the present invention, such as using an element specific selection adjustment to fairly allocate an element to a resource.

Applicants respectfully submit that claim 16 clearly distinguishes over Jones, taken alone or in permissible combination with Chow. Applicants submit that these arguments apply with equal force to claim 45. Applicants therefore respectfully submit that claims 16 and 45, as well as claims 17-29 and 46-54, which depend on claims 16 and 45, are allowable for at least the foregoing reasons.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5084.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 24, 2004.

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